PARCA/Industry Agile Team

Joint PARCA/Industry Agile Team

EVM FOR AGILE DEVELOPMENT

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FEBRUARY 18, 2016

PARCA/Industry Agile Team

PARCA/Industry Initiative

Members from PARCA, DCMA, Intel and Industry have been meeting collaboratively over the last 12 months to share best practice and formulate guidance

Timeline

- Feb 2015 – Industry invited to share EVM implementation approach on Agile Development Programs
  - Synergy and common methodology apparent
- Aug 2015 – Industry invited to share implementation approach for specific EIA guidelines (GL 01, 06, 08, 10, 29)
- Dec 2015 – Industry / PARCA / DCMA deep dive collaboration on GL 06, 10, 29 guidance
- Jan 2016 – Review of draft PARCA paper on Agile EVM methodology

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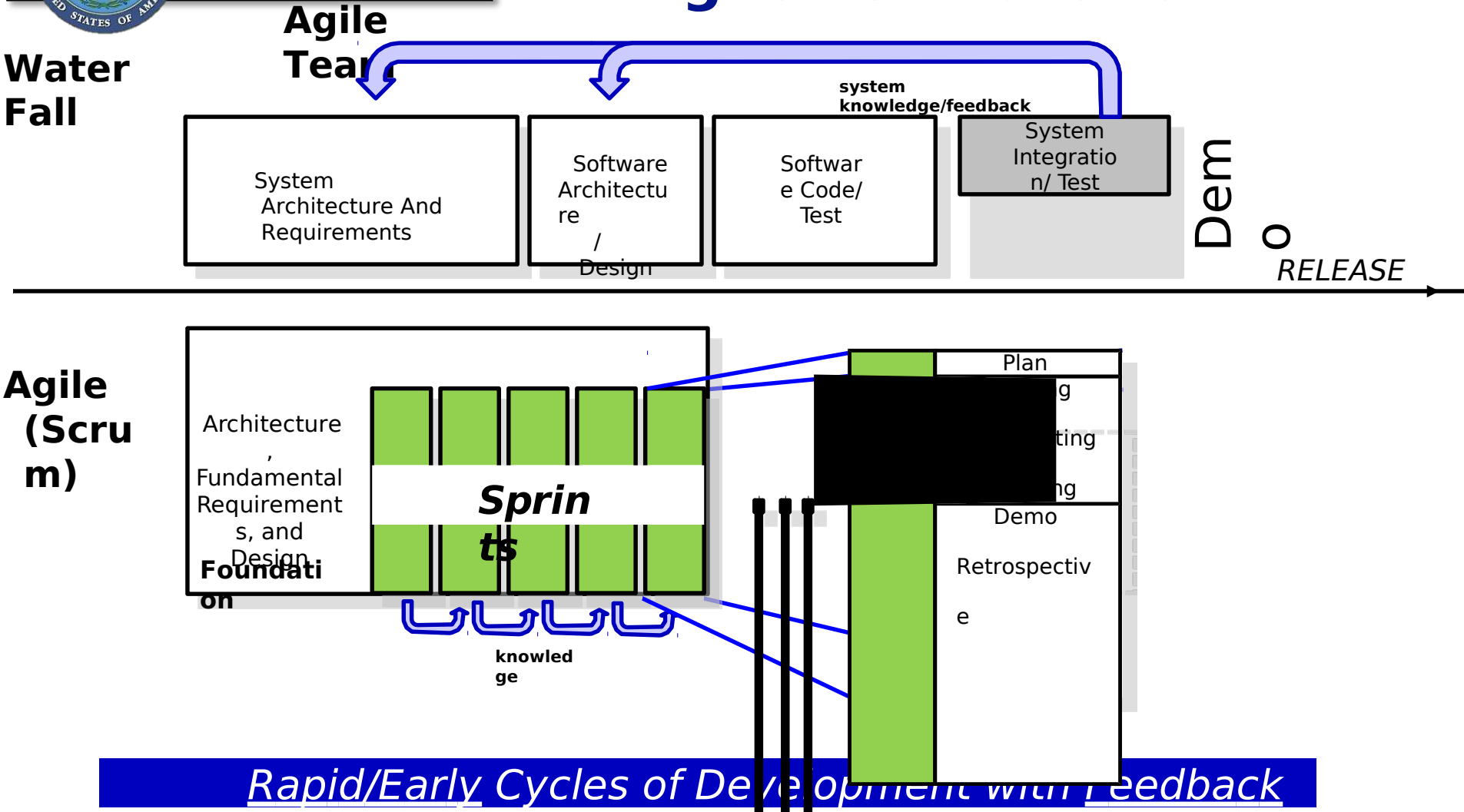
Agile vs. Waterfall



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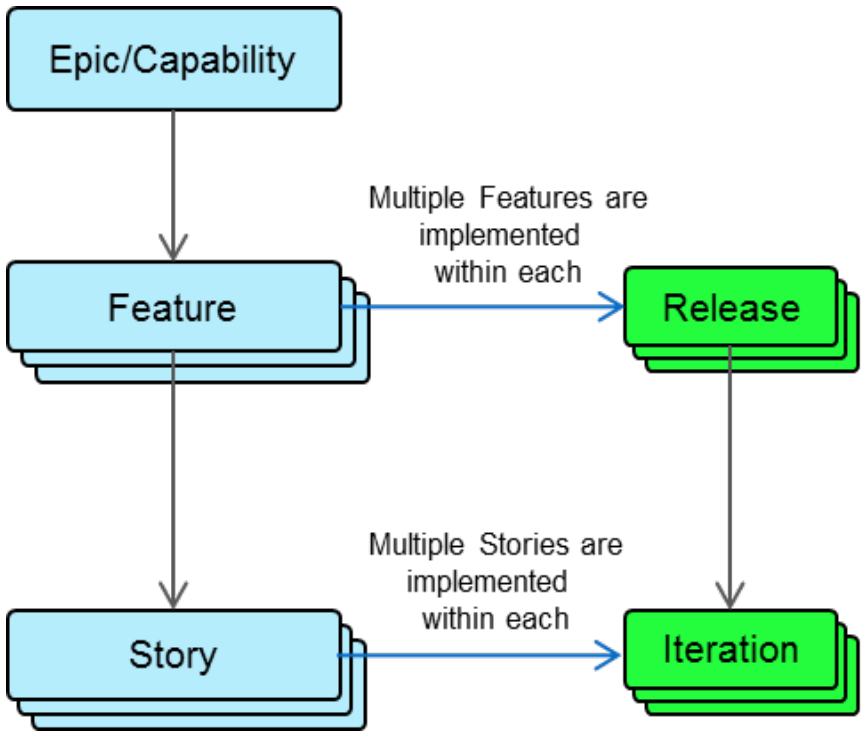
Agile Terminology

- **Epic (capability):** A high level major system function.
- **Feature:** A well defined system function to be completed within a release.
- **Story:** A small but well defined system function that can be developed within one iteration.



- **Release:** Release content has clear goals and objectives and occurs on a regular cadence (not to be confused with a program milestone).
- **Iterations (aka sprints):** Recurring, non overlapping, cadence for development (nominally 2 – 3 weeks).

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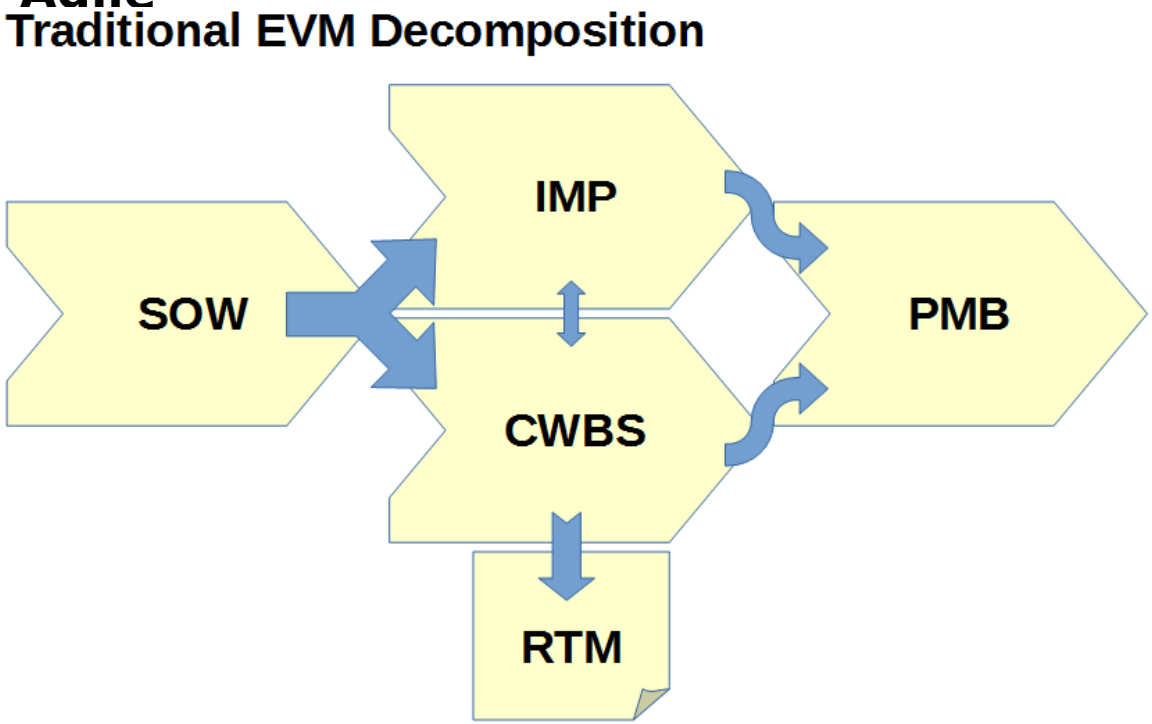
Agile Planning Process

- System requirements are defined below the contract SOW in the Product Backlog
- Product Backlog mapped to C/A and work packages
- Product Backlog Capabilities and Features identified and aligned within WBS
- Baseline budget is defined for CA and WPs using Capability and Feature estimates

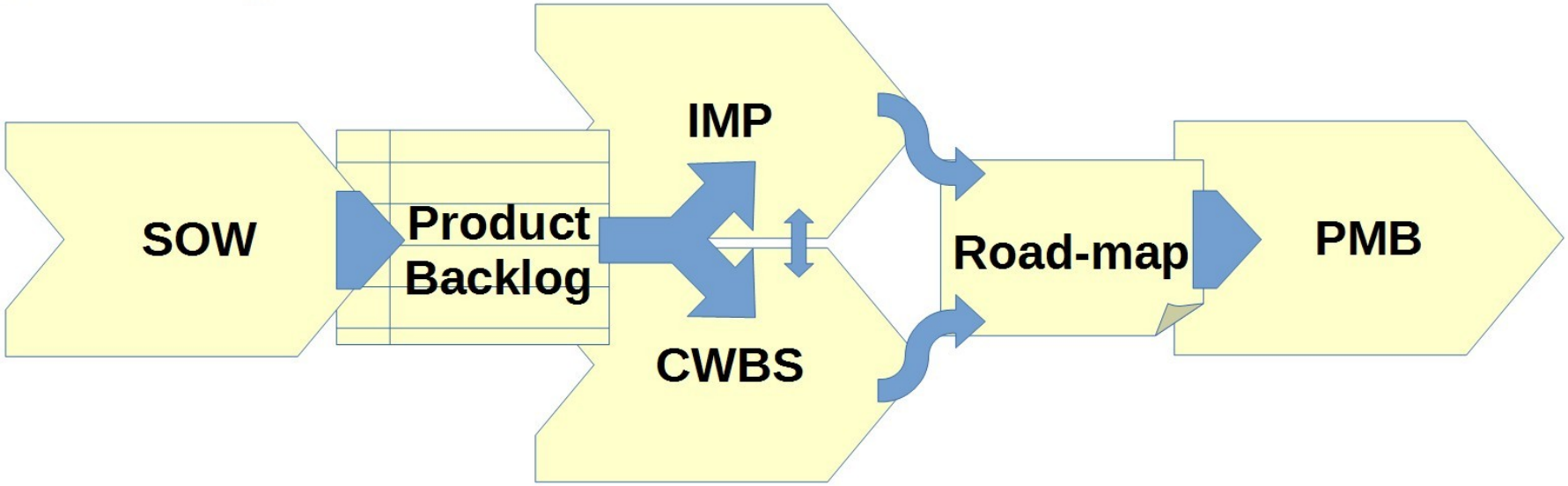
Decomposition the Traditional Way



- Traditionally, a statement of work (SOW) is broken down by a team into manageable chunks through WBS and OBS decomposition into a product-oriented view of a program.

- Engineering manages the requirements traceability matrix (RTM) and works to ensure traceability is maintained to the original SOW as the solution matures.

Decomposition the Agile Way



- Agile software and management methods do not introduce overly significant changes to the typical approach. Instead, it provides the same type of trace to the original SOW by emphasizing the product backlog development.

- Product backlog prioritization determines the overall vision for the program from a business and project standpoint which helps to establish the road-map used for execution.
  This is key as defined by DOD guidance.
  (May 24, 2012 Acquisition Decision Memorandum for an ACAT IAM (Major IT Agile Program) That is Delivering Capability to all Services.)

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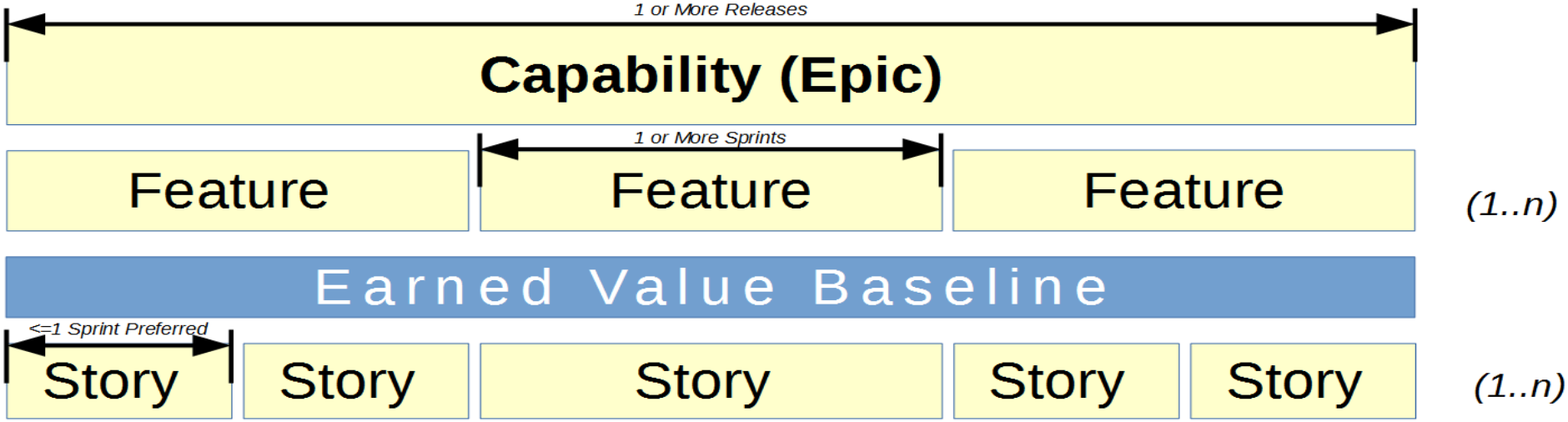
Agile Terminology Refresher



Program Epic/Capability: *May represent core business capabilities which are defined by the customer or stakeholders. A large grained definition of a need that will likely take more than one release to complete. Can be split into features and eventually stories.*

Features: *A discrete and coherent capability within an Epic, scheduled to be completed within a Release, and comprised of a collection of related stories. This is the lowest level of earned value baseline scope definition.*

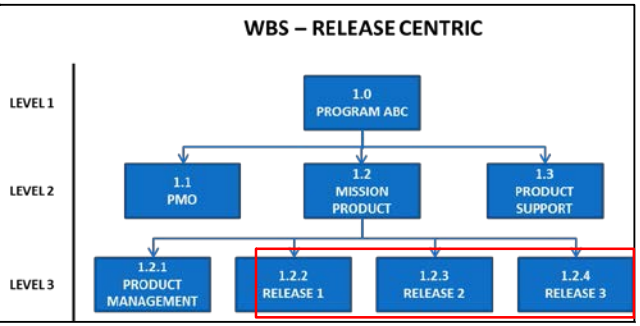
User Stories: *Part of a Feature that can be estimated in size and complexity and prioritized in Sprint backlog. Stories are typically sized to fit within a sprint. Stories are often used to calculate earned value* User stories are developed and maintained below the level of the EVMS PMB.

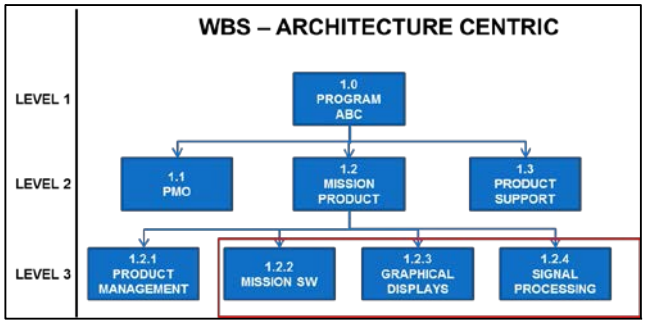
[NDIA Draft, Managing Baseline Change on an Agile Software Development program.]

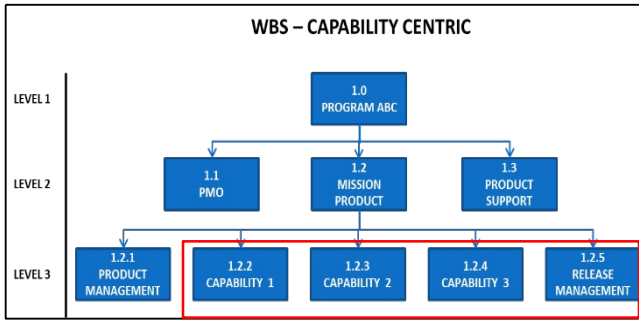
Work Break Down Structure (WBS)

- The WBS organizes the project deliverables into manageable units of work
- Agile programs utilize different WBS structures, but all focus on the delivery of system capabilities of value to the customer

PRODUCT by RELEASE	PRODUCT by ARCHITECTURE	PRODUCT by CAPABILITY
The customer views the product in terms of release. An example of this might be a large satellite ground system where the releases are based around major system events such as launch support, initial calibration, initial operations, and full system operations.	The customer views the product in terms of its software architectural elements. An example of this might be a large ship-based radar system where the releases are incremental deliveries of the system features associated with each of the architectural elements	The customer views the product in terms of a set of discrete capabilities, where the releases are primarily viewed as time boxes for the ongoing and sustained delivery of Features for that capability. The release content may change greatly over time based upon changing priorities







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Agile Program Planning

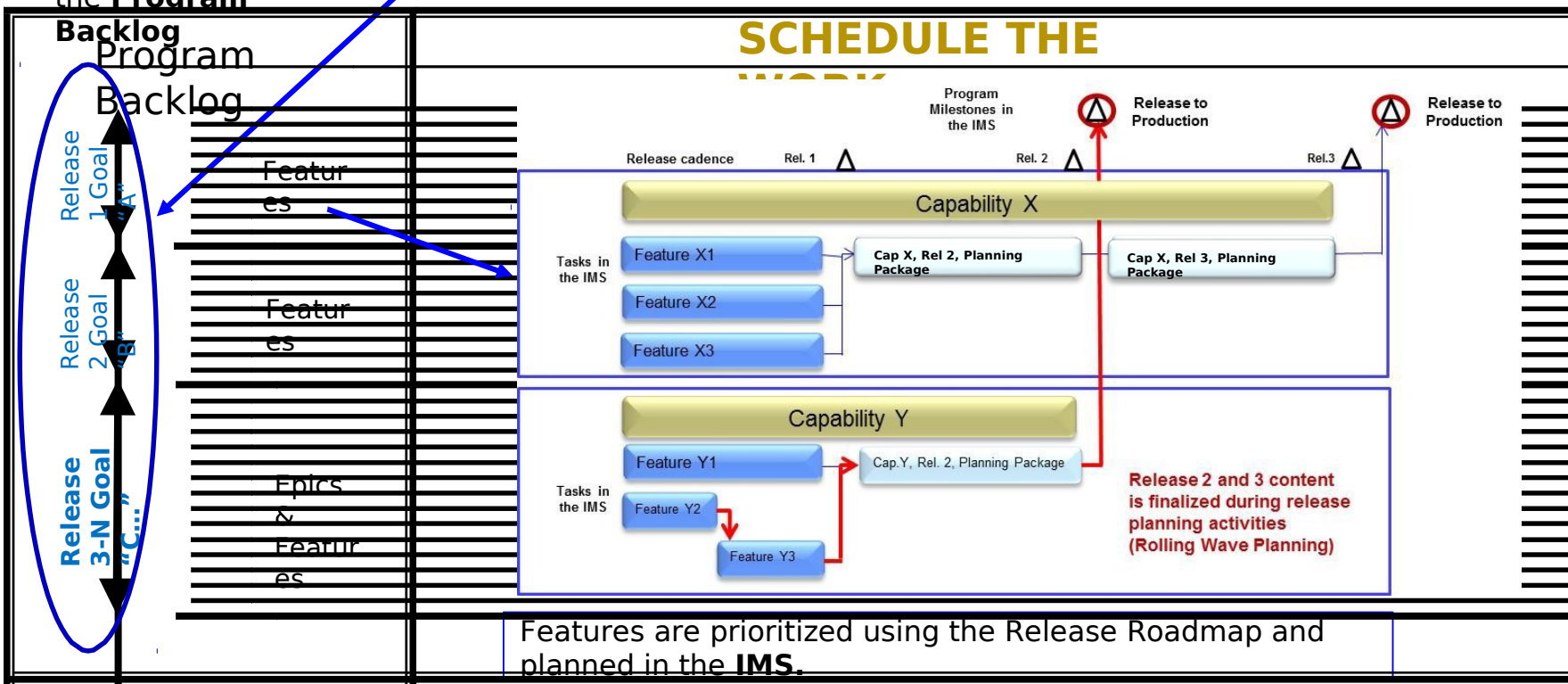
DEFINE THE WORK

SOW Requirements are mapped to Epics and Features in the **Program Backlog**

PLAN THE WORK

The Program Plan is reflected in the **Product Roadmap**, which is an initial allocation of Features and Epics from the Program Backlog to releases based on the objectives and goals of each release.

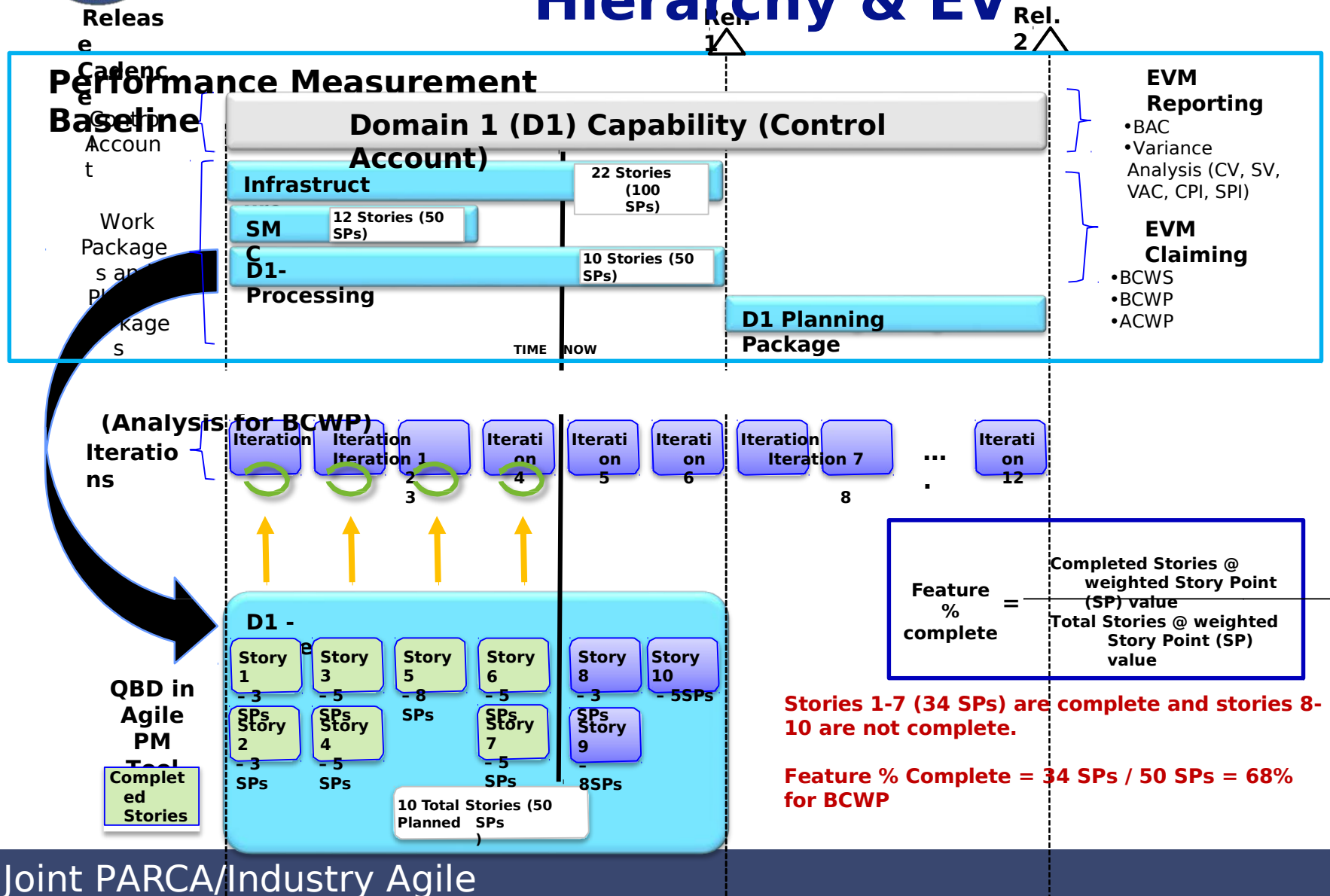
SCHEDULE THE WORK



Features are prioritized using the Release Roadmap and planned in the **IMS.**

Cross release planning occurs before the first release begins, later releases will be less well-defined

Control Account Hierarchy & EV



Tracking Progress During the Release

State after 1st iteration for Feature "D1 - Processing"

Planned Stories	D1 - Processing (Feature) Work Package Description	Story Point Weight	Stories	Notes
1	Build Basic Search	3		Complete ✓
2	Build Automated Search	3		Complete ✓
3	Build Keyword Search	5		
4	Build Boolean Search	5		
5	Add UI Fields for Enhanced Search	8		
6	Add Customizable Interface	5		
7	Implement Filtering	5		
8	Story H	3		
9	Story I	8		
10	Story J	5		
10	Total Stories	Story Point Weight	6	
50			12 %	

D1 - Processing Iterations	Velocity (SPs)
1	6
2	10
3	8
4	10
5	11
6	5
	50

Team plan for completing the Feature

Percent Complete for BCWP

WP PC = Stories Complete / Stories Planned (at weighted value)

2 Stories are complete

12 % of Feature BCWS is claimed as BCWP based on the weighted value of Stories Completed.

Stories only contribute to EV upon completion, "0/100"

Feature PC for BCWP calculation is based on the weighted value of the completed stories

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Iteration 3

State after 3rd iteration for Feature "D1 - Processing"

	Description	Story Point	Stories Completed	Note	Iterations	Velocity (SPs)
1	Build Basic					
2	Build Auto					
3	Build Key					
4	Build Bool					
5	Add UI Fields for Enhanced Search	8		Started	5	10
6	Add Customizable Interface	5		Not Started	6	11
7	Implement Filtering	5		Not Started	7 (Release 2)	5
8	Story H	3		Not Started		50
9	Story I	8		Not Started		
10	Story J	5		Not Started		
10	**Total Stories Story Point Weight**	**50**	**16**			

Now 7 iterations

Team revised plan for completing the Feature

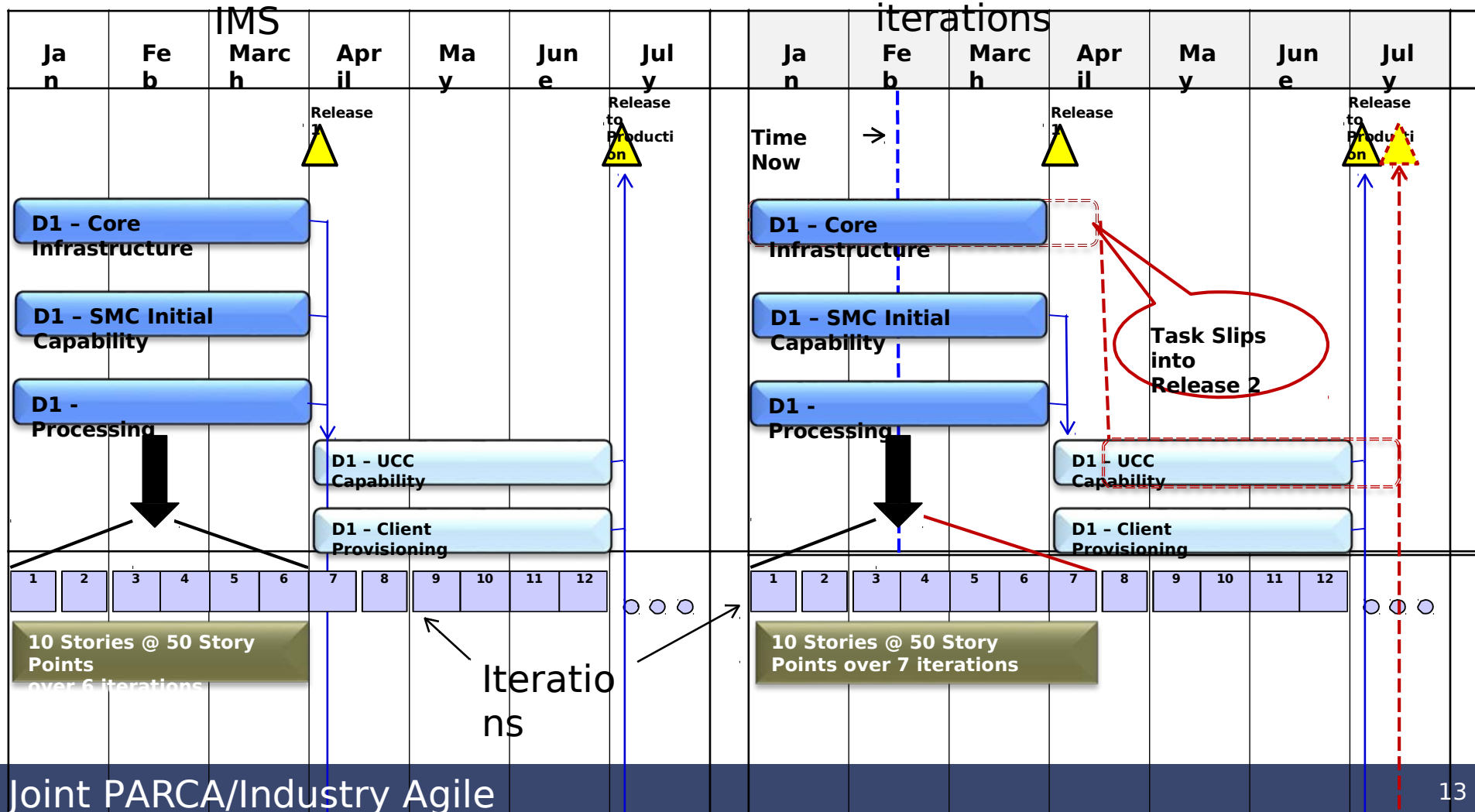
4 Stories are complete. BCWP now =32 % of Feature BCWS

Incomplete Stories are moved to the next iteration. The team analyzes velocity to re-estimate the number of iterations required to complete the Feature Stories. The team now forecasts that it will take 7 iterations to complete the entire Feature. The IMS is

Status on the IMS – Critical Path

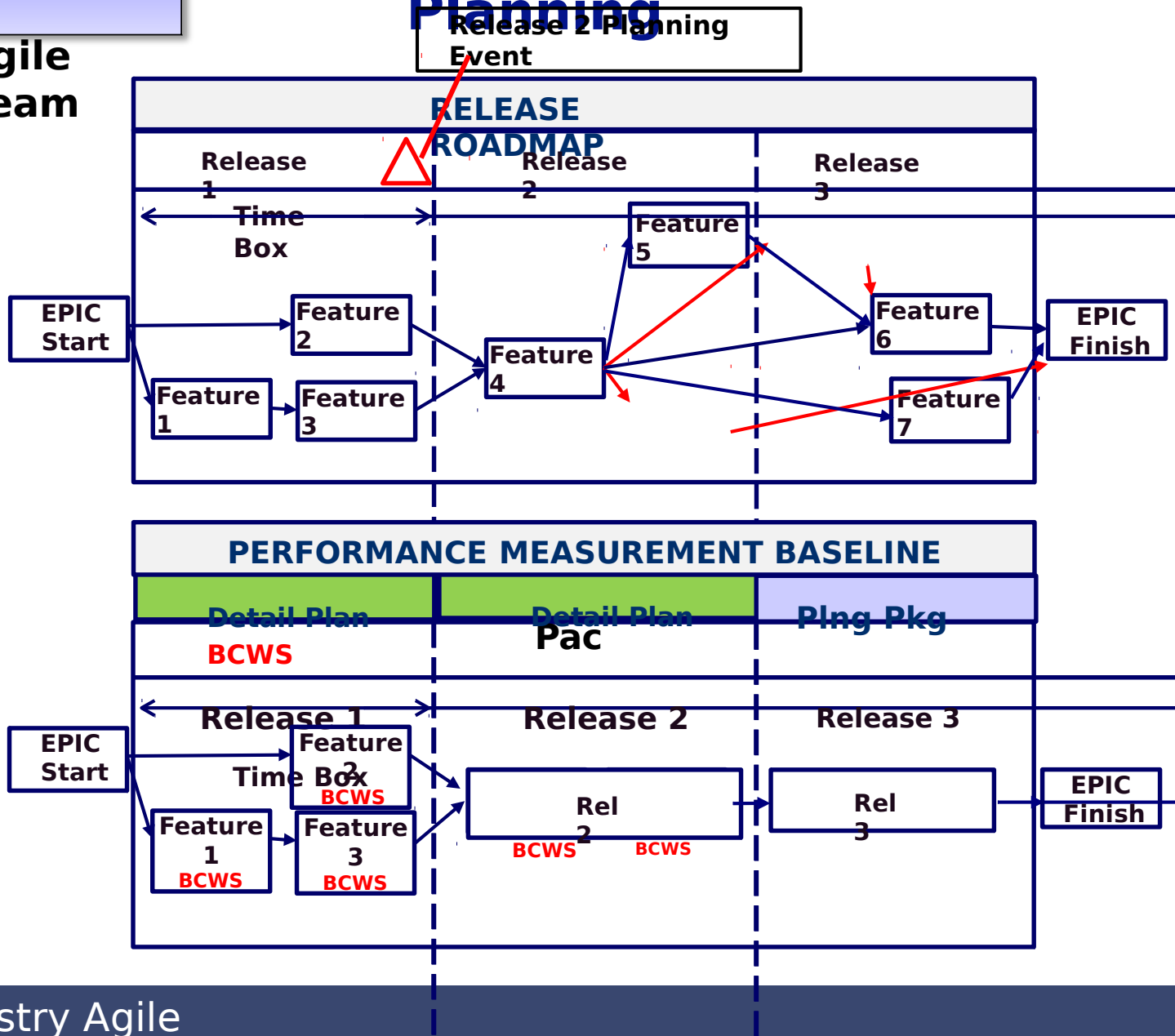
Baseline in IMS

IMS status after 3 iterations



Rolling Wave Planning

Agile Team



Change Scenarios

	Scenario	Baseline Change?
1	A Feature work package that spans 3 sprints has started. 10 stories are mapped to the Feature. At the end of sprint 3, two of the stories planned for sprint 3 did not complete. The two stories are moved to the next sprint (sprint 4)	
2	A Feature work package planned in the current release is baselined to begin next month. The Release roadmap has been updated and the feature is not needed for the current release.	

Change Scenarios

	Scenari	Baseline
3	A Feature work package started and is 30% complete, but did not complete by a formal release date. The release date is held as planned and the customer accepts the delivery without the feature functionality	
4	Features for the current release are re-prioritized. A planned feature is swapped with a different feature from the Product Backlog of a similar size that was mapped to a future release	

Change Scenarios

	Scenario	Baseline
5	The product owner and team determine a user story is deemed unnecessary for the accomplishment feature exit criteria (requirements). The feature WP is in progress.	
6	The product owner and team determine a user story needs to be added for the accomplishment feature exit criteria (requirements). The feature WP is in progress.	effort has increased.

QUESTIONS?